

UNITED STATES PATENT OFFICE

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LIQUID MEASURING APPARATUS

Application filed January 30, 1930. Serial No. 424,626.

This invention relates to a liquid measuring apparatus, and has reference more particularly to an apparatus of the rotating dipper type, having an adjustable means for varying the liquid flow.

In various manufacturing processes, it is often desirable to have a liquid fed at a uniform rate and to have this rate of flow accurately adjusted and capable of minute changes between given limits. Among the uses where such a measuring apparatus is desirable is in the supply of foam-producing liquids to a foam cell or beater, the foam being later mixed with a cementitious material, such as gypsum prior to setting for the purpose of producing a light weight product. Other uses for an apparatus of the present invention are in the handling of corrosive liquids containing sediment or scale, such as caustic soda and bleach liquors used in paper mills. The apparatus is also useful in measuring liquids used in flotation apparatus in the mining industry.

An object of this invention, therefore, is to provide an apparatus for accurately measuring liquids so that a uniform and minutely adjustable rate of discharge of liquid from the apparatus is obtained; also to improve liquid measuring apparatus in other respects hereinafter specified and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which

Fig. 1 is a central, sectional elevation through the liquid measuring apparatus,

Fig. 2 is a plan view of the apparatus with cover removed,

Fig. 3 is a sectional elevation through the apparatus, taken on the line 33 of Fig. 1, and

Fig. 4 is a sectional elevation through the apparatus on the line 44, of Fig. 1.

The apparatus consists of a solution casing or container 10 which may be of any suitable construction, but in the preferred form, it includes a semi-cylindrical bottom 11 integrally connected to a hopper 12 which is substantially rectangular in cross section. Suitable shaped cast ends 13 and 14 close the ends of the solution container 10 and a

cover 15 is placed on top of the container, said cover being provided with a depending peripheral flange 16 extending around the inside of the container. The cover is provided with a handle 17 so that the former can be readily removed for inspection of the apparatus contained in the container.

A shaft 18 passes through a bearing 19 formed on the container end 14, said shaft being driven continuously by any suitable source of power, such as electric motor not shown. A wheel 20 is arranged in the container 10 being provided with a hub 21 rigidly secured to the shaft 18. A series of dippers or cups 22 is rigidly secured around the periphery of wheel 20 by means of brackets 23, said dippers being arranged to dip below the surface of the liquid to be measured which is contained in the container 10. The dippers 22 are preferably rectangular in cross section and are provided with outstanding flanges 25 formed around the open periphery of the cups for the purpose of strengthening the walls thereof and for insuring a uniform discharge of liquid over the full width of each dipper.

A tray 27 provided with semi-cylindrical ends 28 and upturned edges 29, is mounted so as to receive the liquid discharged from the dippers 22 as they rise to their uppermost position on the wheel 20. A drain pipe 30 is secured to the bottom of the tray 27, said drain pipe passing through connection 31 on the bottom of the container 10. The pipe 30 leads to any suitable discharge point such as a foam cell, as previously mentioned for whipping the liquid into a foam, later to be used for mixing with cementitious material to make same light in weight. In order to prevent the liquid from prematurely producing a foam in the measuring apparatus, we provide a semi-circular stationary shield 33 secured between the tray ends 28, as by rivets 34. The liquid flowing over the lower edge of dippers 22 falls onto this shield, and flows quietly down the shield into the tray 27 without forming foam. The lower edges of the shield 33 are disposed a short distance inwardly from the